

WHAT IS CLAIMED IS:

- 1 1. A laser-processing machine comprising:
2 a measuring cell into which gas to be analyzed can flow;
3 a means for decoupling diagnostic radiation from laser radiation provided for material
4 processing of a workpiece; and
5 a sound detector for detecting a photo-acoustical effect due to absorption of the
6 diagnostic radiation by gas in the cell.
- 1 2. The laser-processing machine of claim 1, wherein the laser radiation is CO₂ laser
2 radiation.
- 1 3. The laser-processing machine of claim 1, wherein the means for decoupling the
2 diagnostic radiation from the laser radiation includes a means for diffracting laser
3 radiation used for power measurement.
- 1 4. The laser-processing machine of claim 1, wherein the means for decoupling the
2 diagnostic radiation from the laser radiation includes a means for reflecting laser
3 radiation used for power measurement.
- 1 5. The laser-processing machine of claim 1, wherein the means for decoupling the
2 diagnostic radiation from the laser radiation includes a partially-transparent mirror for
3 reflecting laser radiation used for power measurement.
- 1 6. The laser-processing machine of claim 5, wherein the partially-transparent mirror is a rear
2 mirror of the radiation source.
- 1 7. The laser-processing machine of claim 1, further comprising a mechanical means for
2 generating a pulsed diagnostic radiation.
- 1 8. The laser-processing machine of claim 1, further comprising an electronic means for
2 generating a pulsed diagnostic radiation.

- 1 9. The laser-processing machine of claim 1, further comprising a control unit for using a
2 rinsing gas in response to the photo-acoustical effect measured.
- 1 10. The laser-processing machine of claim 9, wherein the control unit is formed for
2 controlling the flow rate of one or more supply gases of the laser processing machine and
3 of working or cutting gases in response to the analysis of a gas atmosphere in feed lines
4 or in a laser beam path.
- 1 11. The laser-processing machine of claim 1, further comprising a common measuring cell
2 for analyzing gases of the laser-processing machine.
- 1 12. The laser-processing machine of claim 11, wherein the gases of the laser-processing
2 machine are supply gases of the laser-processing machine.
- 1 13. The laser-processing machine of claim 11, wherein the gases of the laser-processing
2 machine are cutting gases.
- 1 14. The laser-processing machine of claim 11, wherein the gases of the laser-processing
2 machine are working gases.
- 1 15. The laser-processing machine of claim 1, further comprising a filter, wherein the
2 configuration of the measuring cell and the sound detector are adapted for use to monitor
3 the effect of the filter.
- 1 16. A method for controlling the laser-processing machine of claim 1, wherein in response to
2 the measured photo-acoustical effect, a speed of processing is reduced.
- 1 17. A method for controlling the laser-processing machine of claim 1, wherein in response to
2 the measured photo-acoustical effect, a speed of processing is stopped.